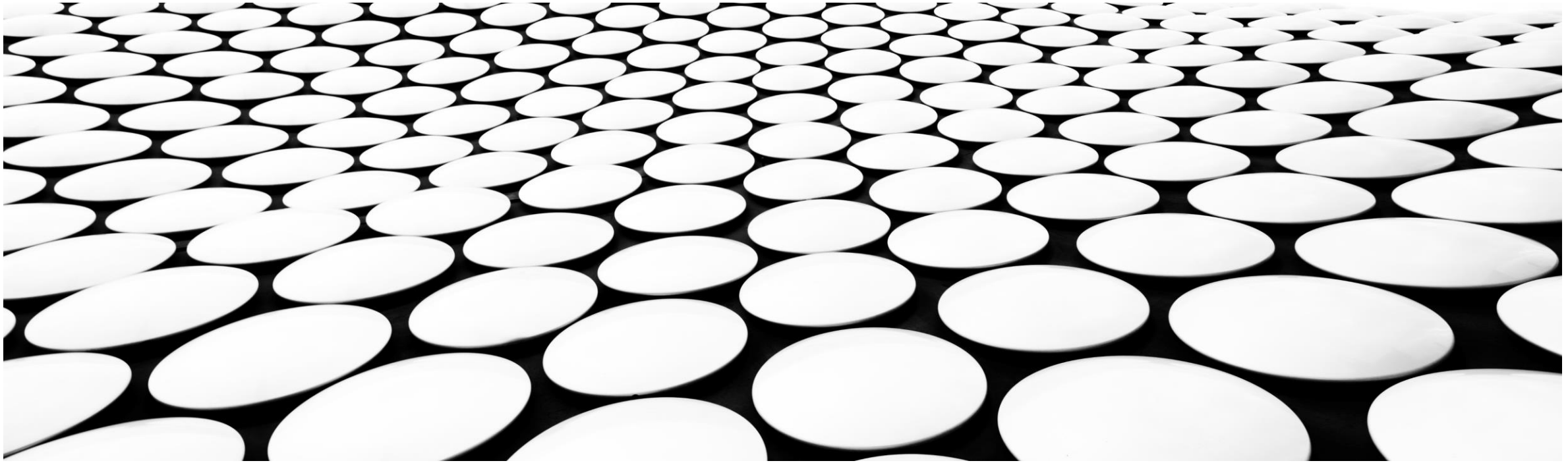
COVID-19 VACCINATION WORLD PROGRESS

Analyzed By Ahmed Elsayed

Source: https://www.kaggle.com/datasets/gpreda/covid-world-vaccination-progress



EXECUTIVE SUMMARY

- This report provides an in-depth analysis of global COVID-19 vaccination trends using data sourced from Kaggle COVID-19 World Vaccination Progress. The dataset integrates daily country-level vaccination statistics with geographic and manufacturer details to offer comprehensive insights.
- Key highlights include:

1. Dataset Overview:
    - Coverage of vaccination data for multiple countries.
    - Metrics include daily vaccinations, total doses administered, and the number of individuals partially or fully vaccinated.
2. Objective:
    - To analyze global vaccination progress and identify patterns or gaps in distribution.
    - Insights aim to support policymaking, resource allocation, and global health planning.

EXECUTIVE SUMMARY

1. Analysis Focus:
    1. Identification of top-performing regions based on vaccination rates.
    2. Correlation of vaccination trends with demographic and geographic factors.
    3. Examination of vaccine manufacturer contributions.
2. Findings:
    1. Variability in vaccination progress across regions.
    2. Disparities in access and uptake influenced by economic and logistic factors.
    3. Contributions of specific vaccine types to overall progress.

INTRODUCTION

- The COVID-19 pandemic has profoundly impacted global health, economies, and societies, necessitating an unprecedented global vaccination effort. Vaccines have proven to be the most effective tool for mitigating the spread of the virus, reducing severe cases, and enabling the gradual return to normalcy.
- This report analyzes COVID-19 vaccination data from the **Our World in Data GitHub repository**, which compiles daily updates on vaccination efforts worldwide. The dataset includes comprehensive information on vaccination rates, geographic distribution, and vaccine manufacturer details. By examining this data, the report aims to provide a clear understanding of vaccination progress, regional disparities, and factors influencing vaccine uptake.
- The analysis focuses on answering key questions:
- Which regions have achieved the highest vaccination coverage?
- What patterns emerge in vaccination distribution and uptake?

METHODOLOGY

- This analysis is based on the structured examination of COVID-19 vaccination data sourced from the **Our World in Data GitHub repository**. The methodology specific to the data provided is as follows:

1. **Data Source**:
    - The dataset includes daily vaccination statistics at the country level, providing details on metrics such as total vaccinations, individuals partially and fully vaccinated, and vaccine manufacturers.
2. **Data Structure**:
    1. Key fields include:
        1. **Country**: Name of the reporting country.
        2. **ISO Code**: Standardized country code.
        3. **Date**: Daily record entries.
        4. **Vaccination Metrics**: Cumulative and daily totals of doses, partially vaccinated, and fully vaccinated individuals.

METHODOLOGY

1. Analysis Steps:
    1. Descriptive Statistics:
        - Summarizing key metrics to identify top-performing countries and global vaccination progress.
    2. Trend Analysis:
        - Tracking vaccination rates over time by country.
    3. Comparison:
        - Evaluating regional disparities using vaccination totals and ratios relative to population.
    4. Manufacturer Insights:
        - Analyzing vaccine types administered in different countries to assess contributions.
2. Tools and Techniques:
    - Python was used to process the dataset, clean missing or inconsistent entries, and generate visualizations for clarity and impact.

FINDINGS AND IMPLICATIONS

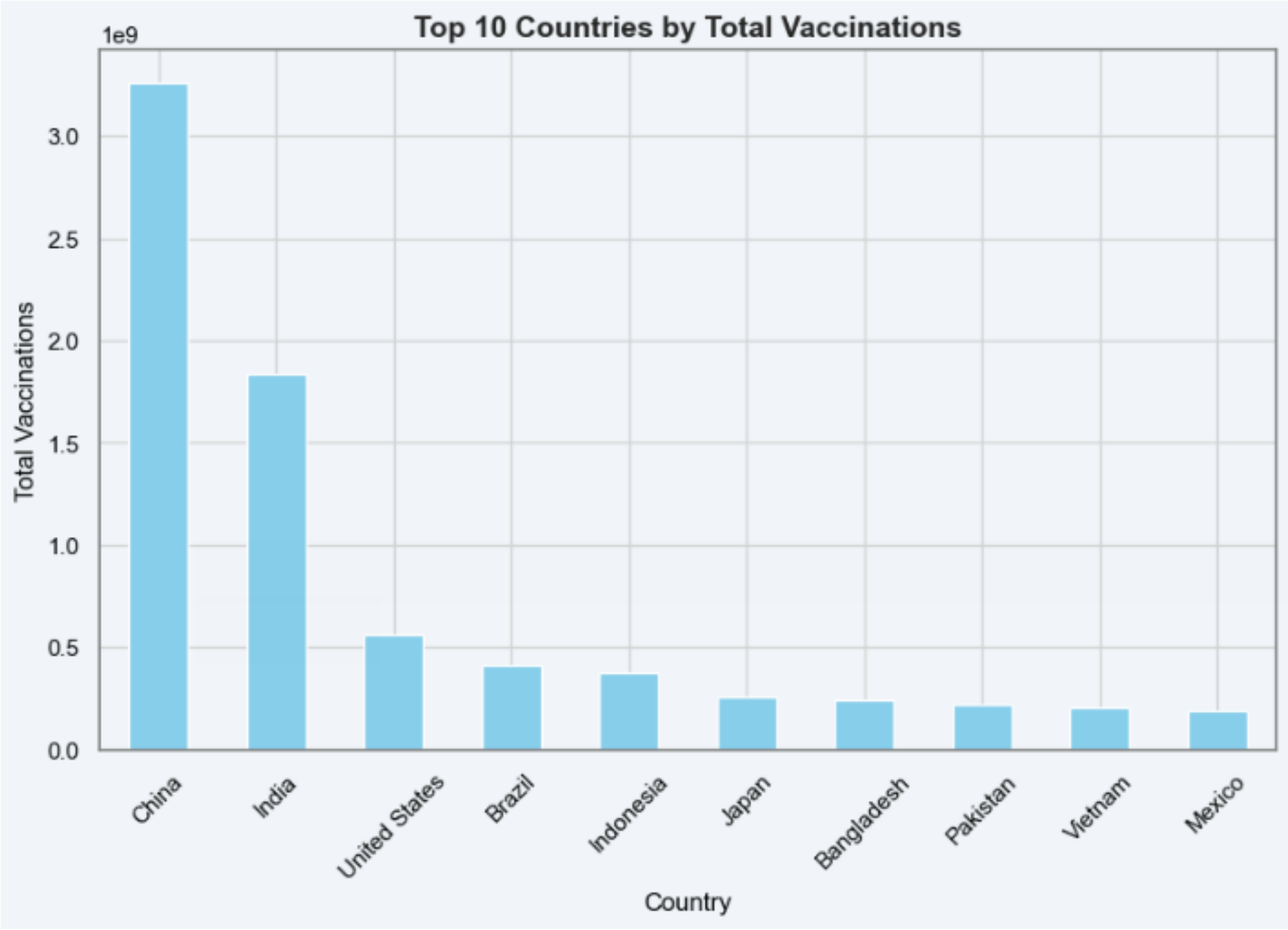
1. Global Vaccination Progress:
   - Significant disparities exist between countries in terms of total vaccinations and vaccination rates relative to population.
   - High-income countries demonstrate faster and more comprehensive vaccination coverage compared to low-income countries.
2. Top-Performing Countries:
   - A few countries lead in vaccination totals, showcasing robust healthcare infrastructure and access to vaccines.
   - Nations with smaller populations often achieve higher coverage rates quickly.
3. Vaccine Distribution Trends:
   - Regions with access to multiple vaccine manufacturers exhibit faster rollout compared to those reliant on a single source.
   - The use of different vaccine types varies significantly across regions, reflecting diverse procurement strategies and logistical capabilities.
4. Temporal Patterns:
   - Vaccination rates increased sharply in regions with aggressive public health campaigns and government support.
   - Some countries displayed stagnation in their vaccination progress, possibly due to supply constraints or vaccine hesitancy.
5. Data Gaps:
   - Missing data entries and inconsistent reporting impact the ability to draw precise conclusions for certain countries.

The notebook contains detailed analysis of the charts, please visit it

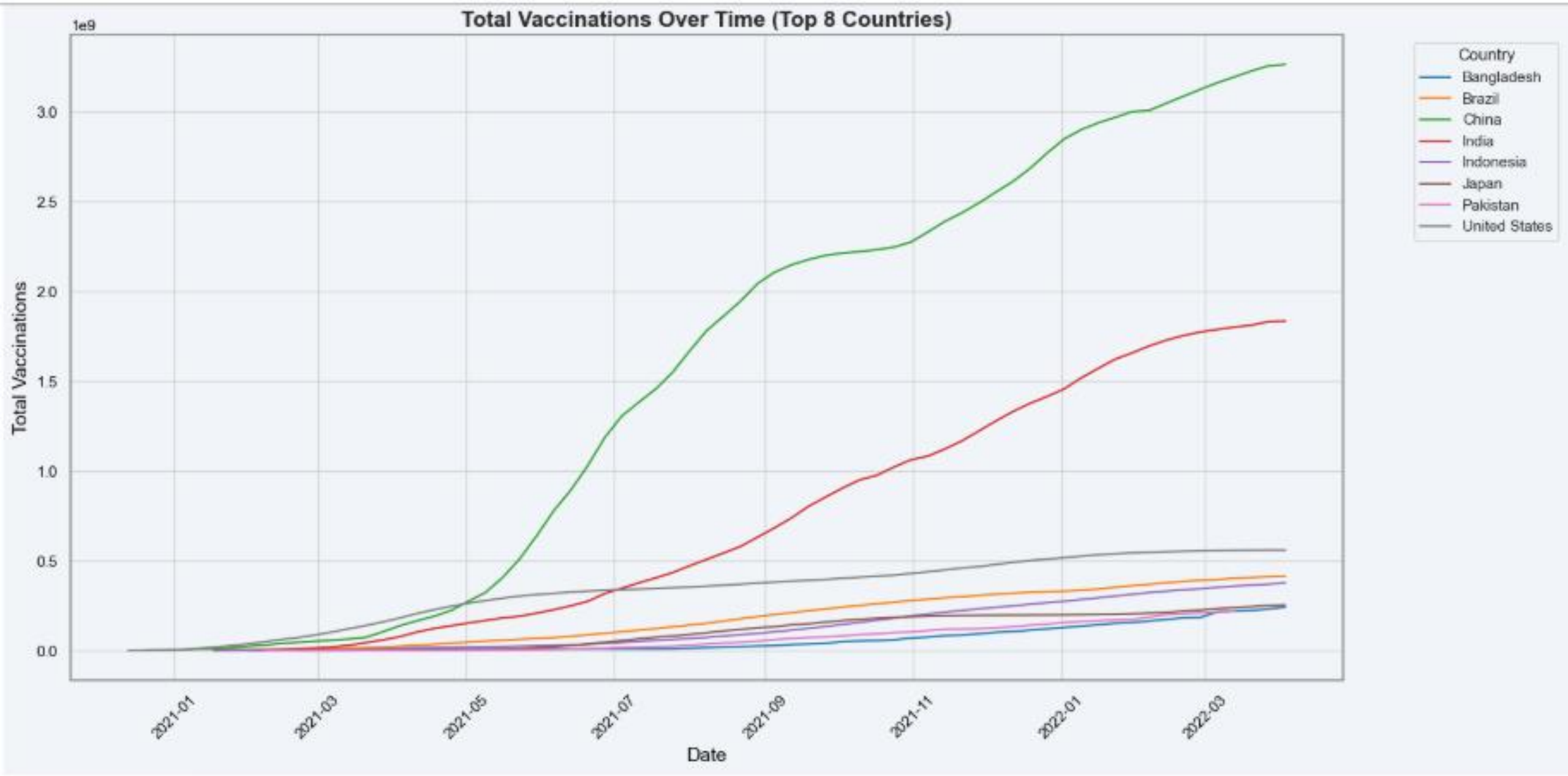
IMPLICATIONS

1. Equity in Vaccine Distribution:
   - Addressing disparities in vaccine access is critical to achieving global immunity. International collaboration and support are essential for low-income countries.
2. Policy Focus:
   - Countries with slower rollout need targeted interventions to overcome logistical and socio-economic barriers.
   - Vaccine hesitancy requires tailored public education campaigns to improve uptake.
3. Monitoring and Data Quality:
   - Enhancing the consistency and granularity of data reporting will improve the ability to track progress and identify issues in real time.
4. Strategic Resource Allocation:
   - Insights into manufacturer contributions can guide procurement strategies, ensuring diverse and sustainable vaccine supplies.

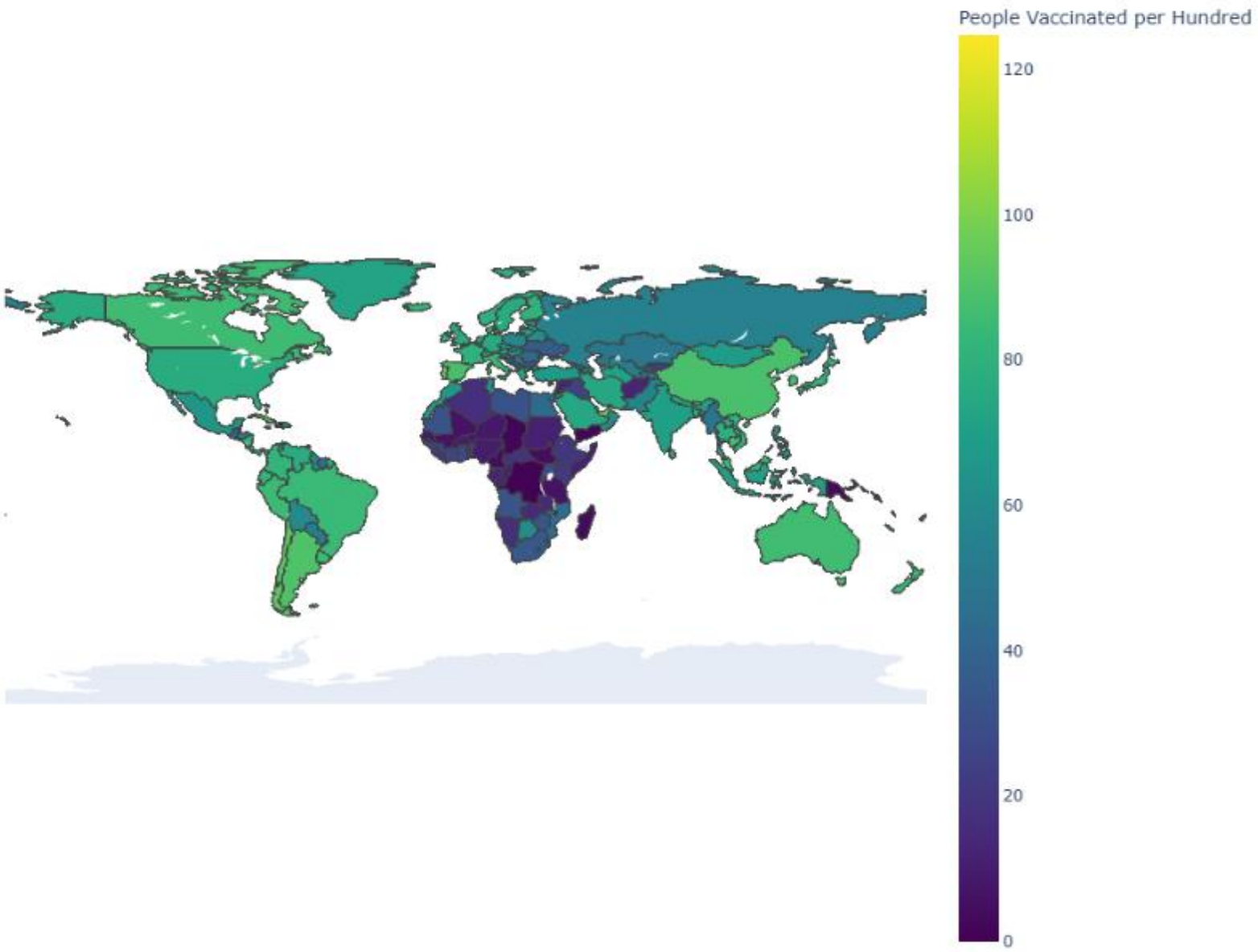
APPENDIX



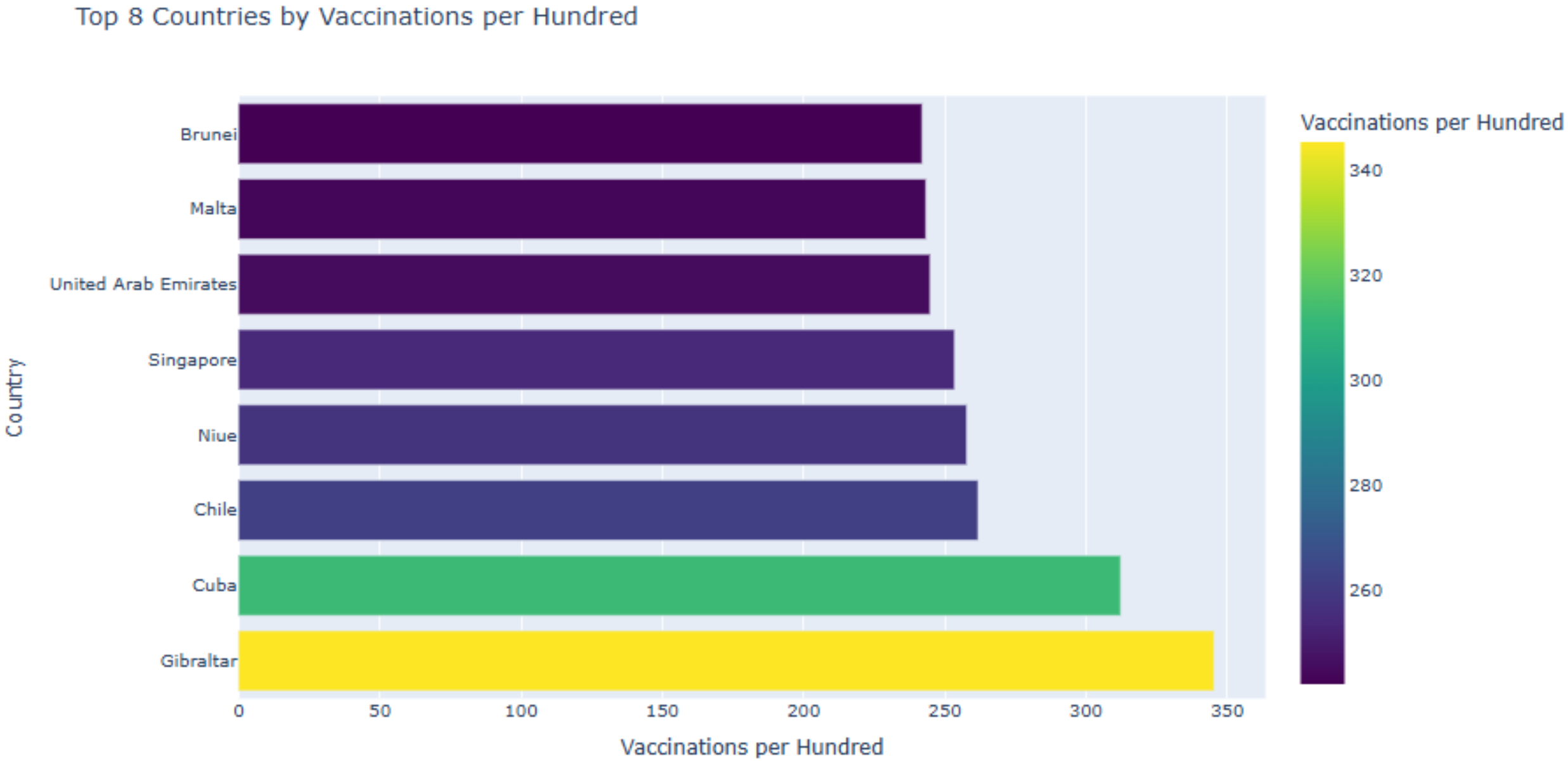
Bar Graph Showing Top 10 Countries by Total Vaccinations



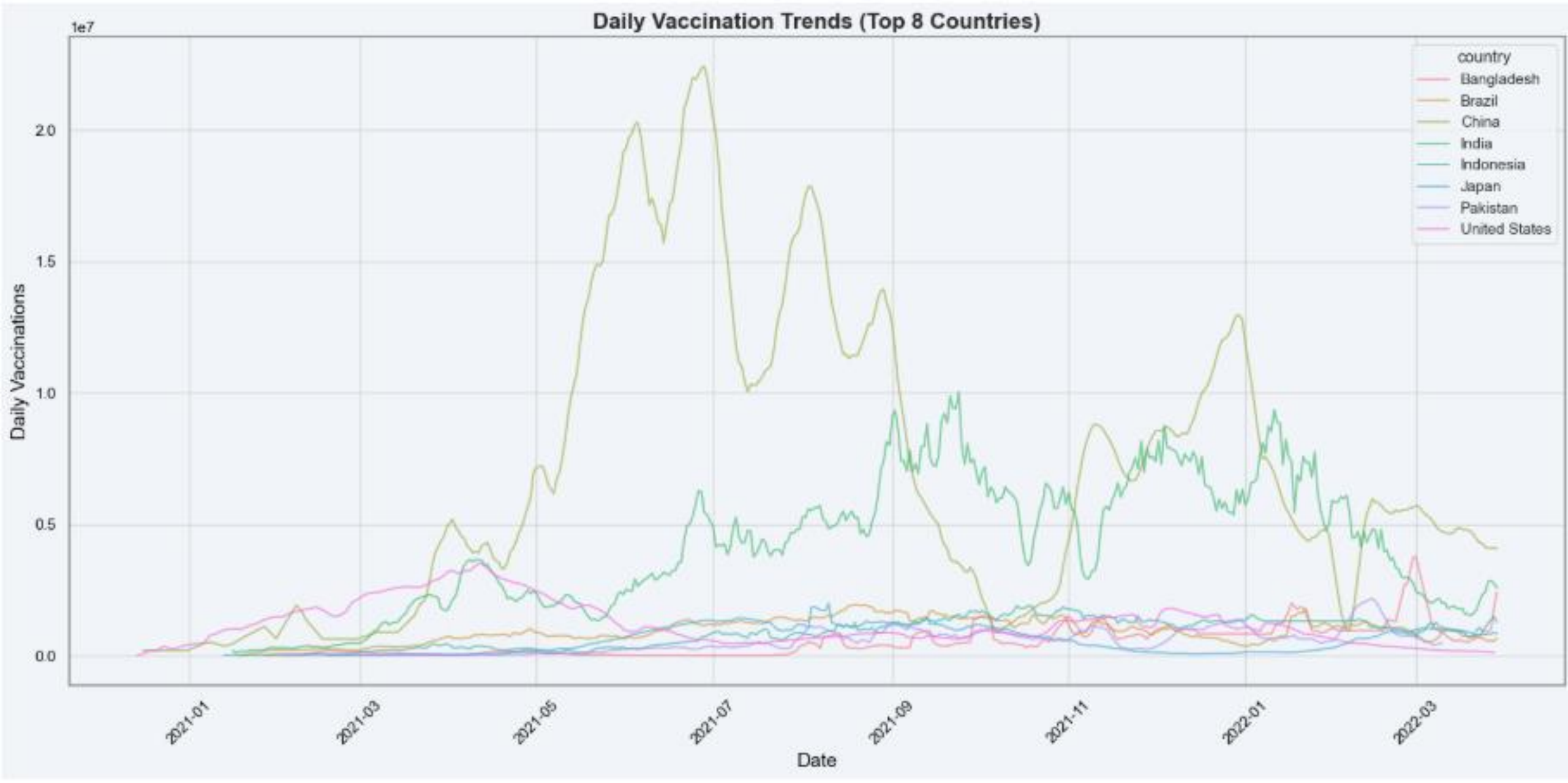
Line Graph Showing Total Vaccinations Over Time



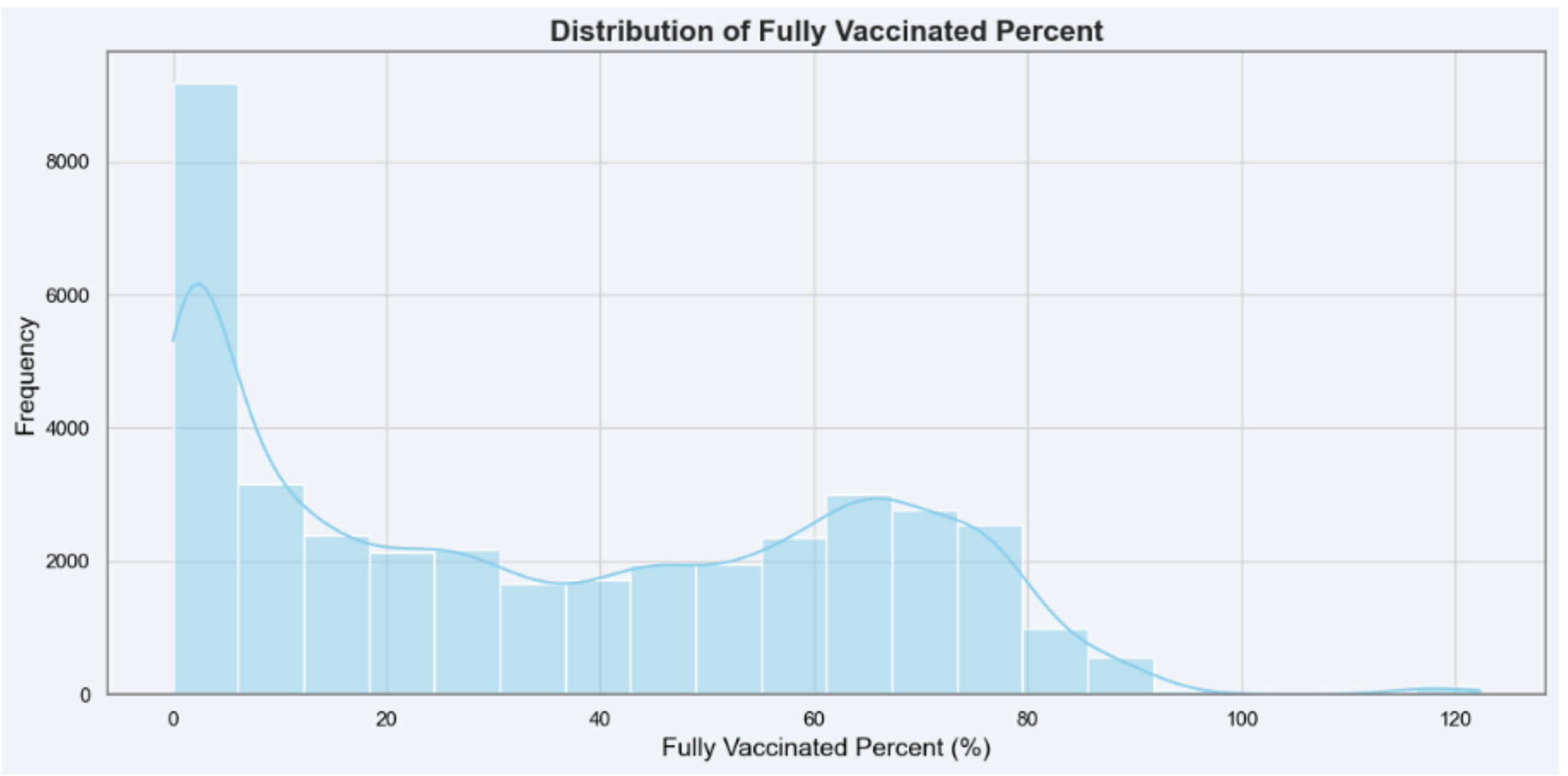
Map Showing People Vaccinated Percentage



Bar Chart Showing Top 8 Countries by Vaccinations Percents

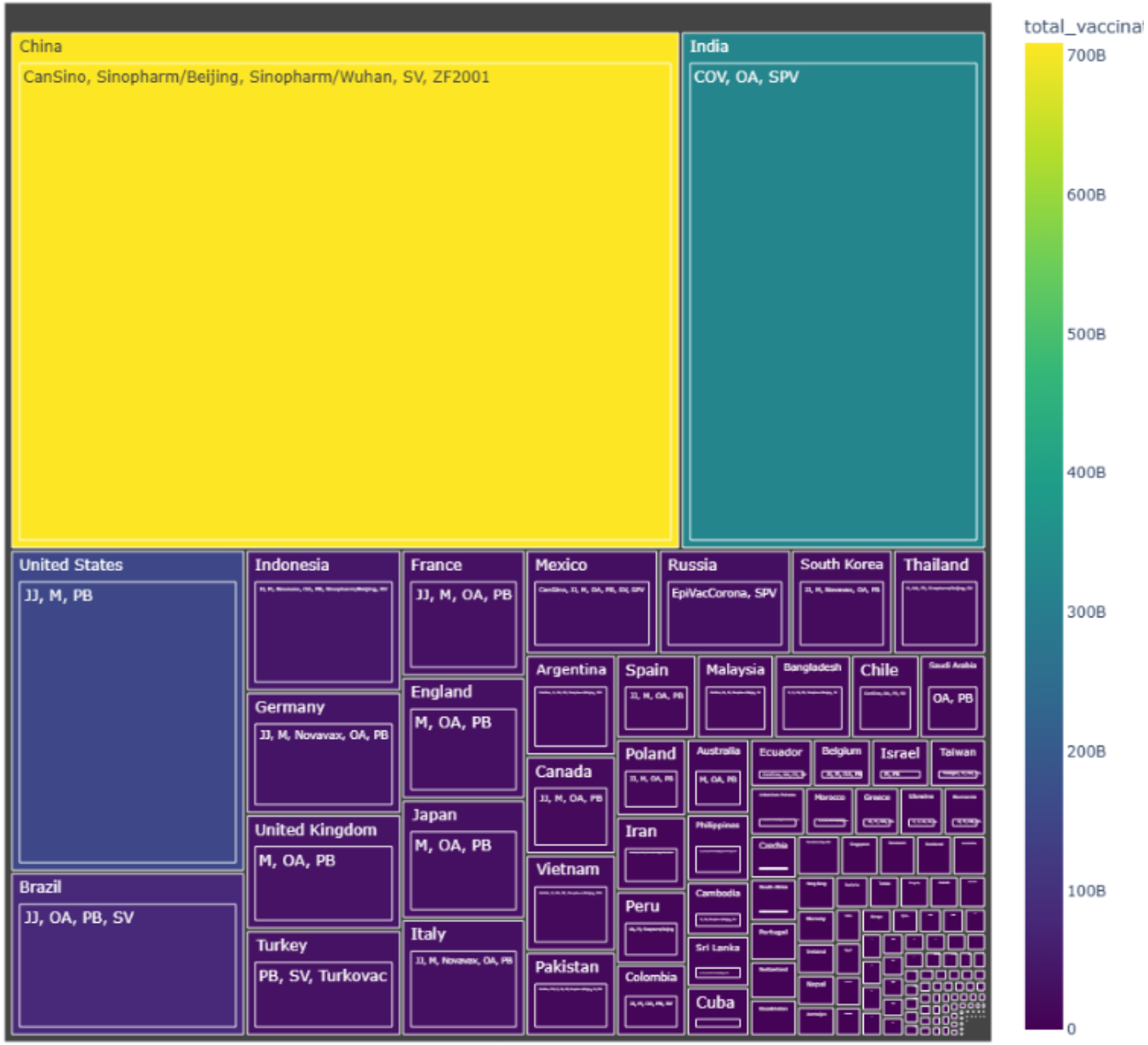


Line Graph Showing Daily Vaccination Trends



Distribution of Fully Vaccinated Percent

Treemap of Vaccines Used by Country



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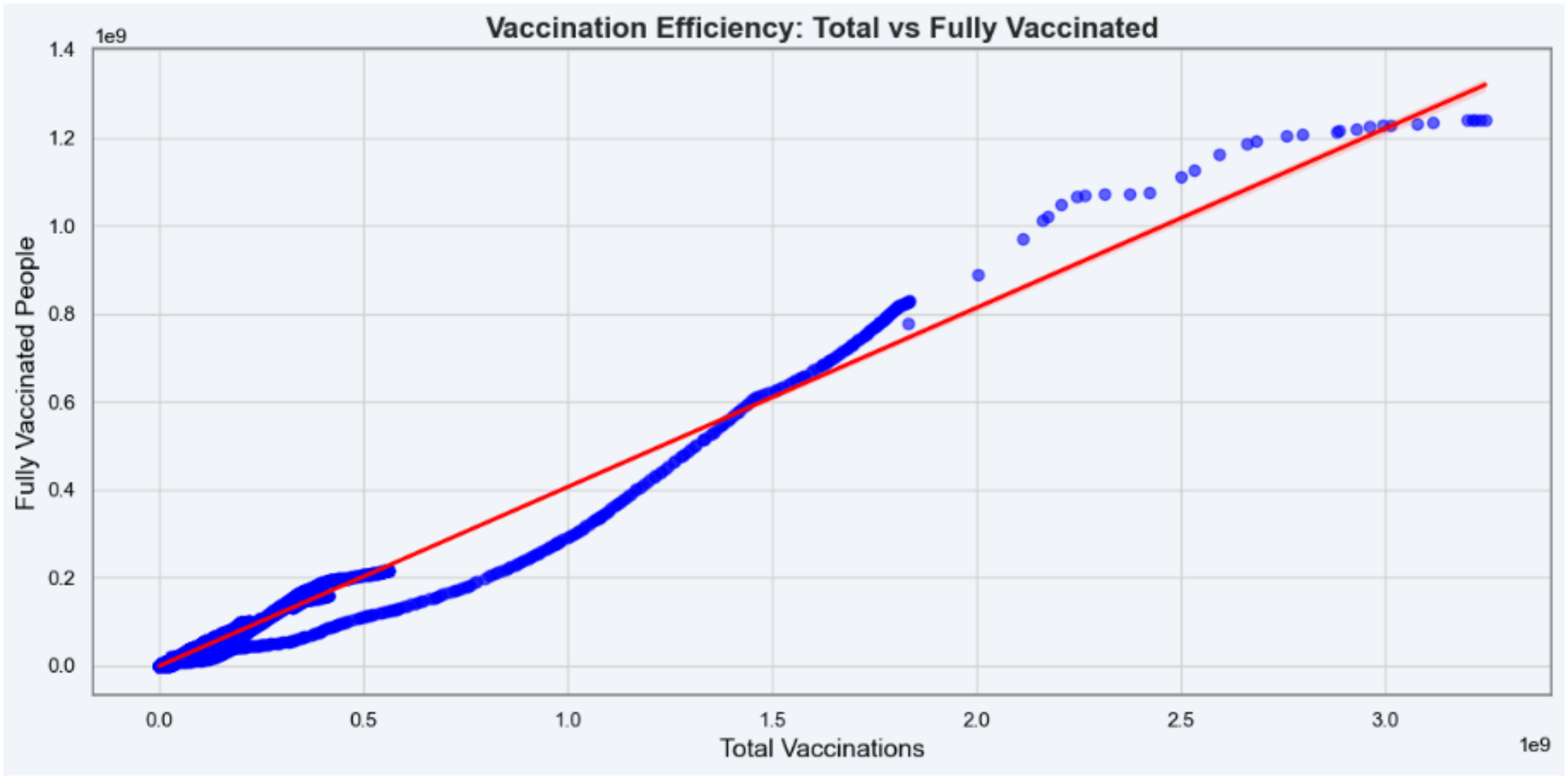
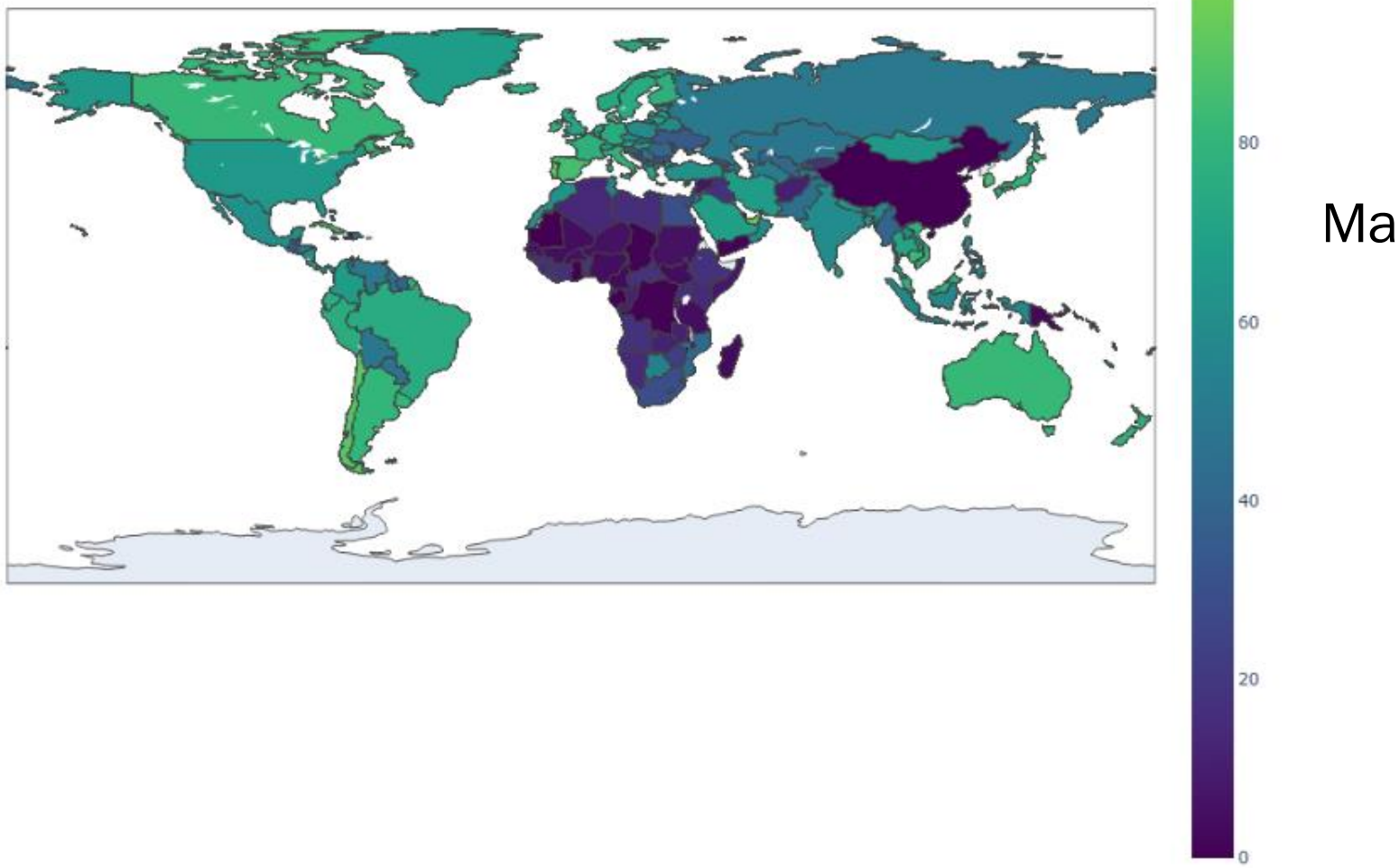


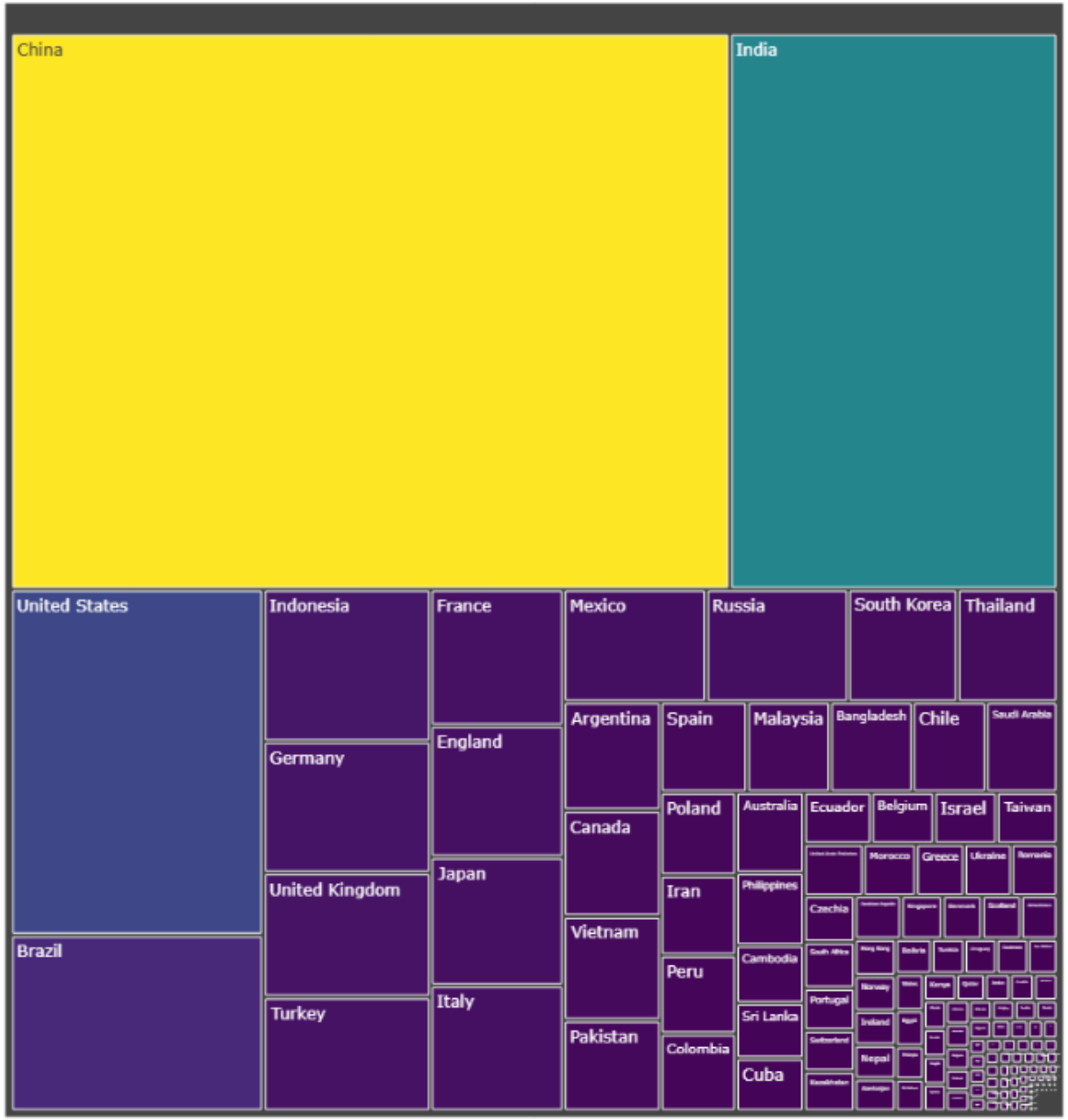
Vaccination Efficiency: Total vs Fully Vaccinated

Vaccination Progress by Fully Vaccinated Percent

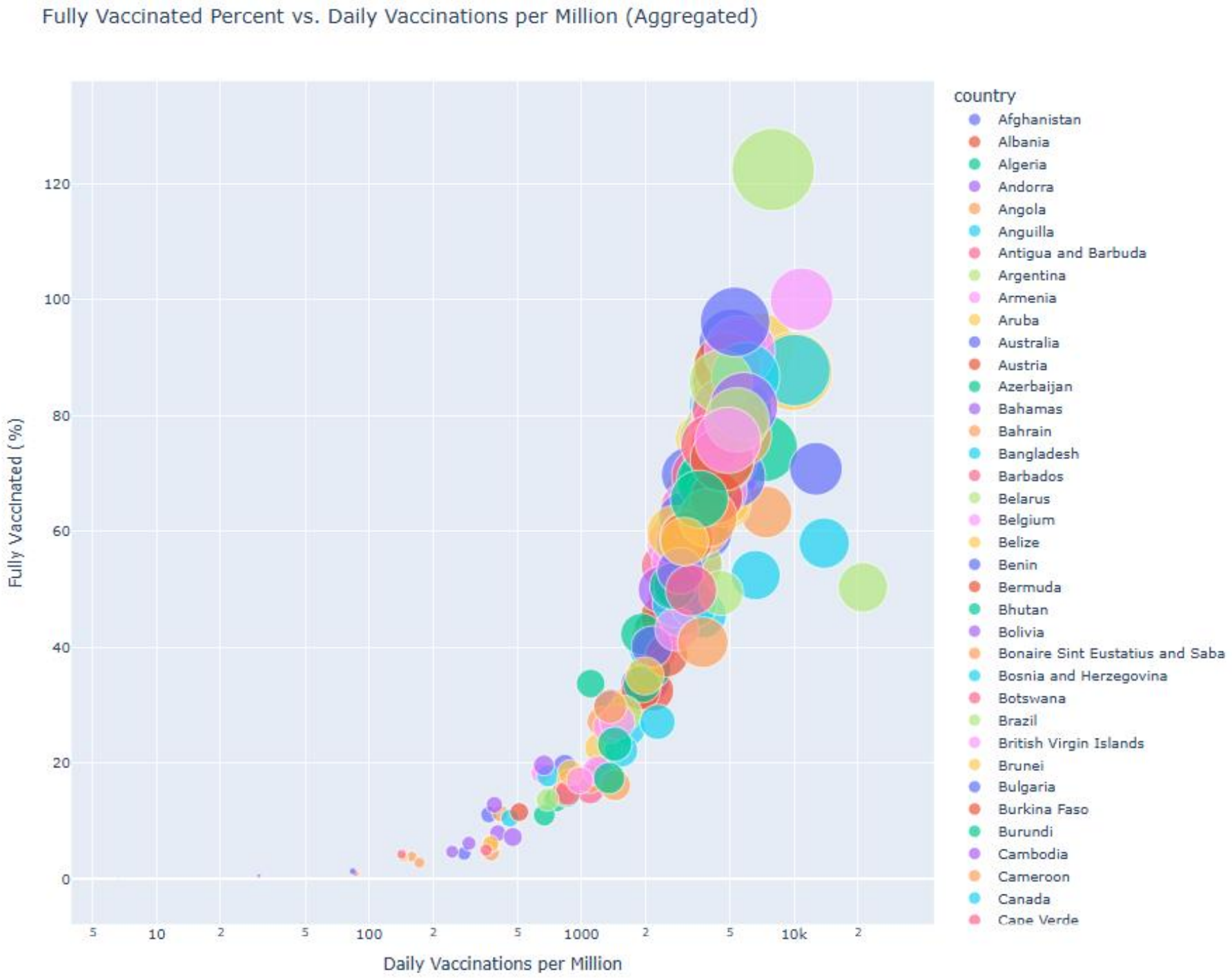


Map of Fully Vaccinated Perecentage

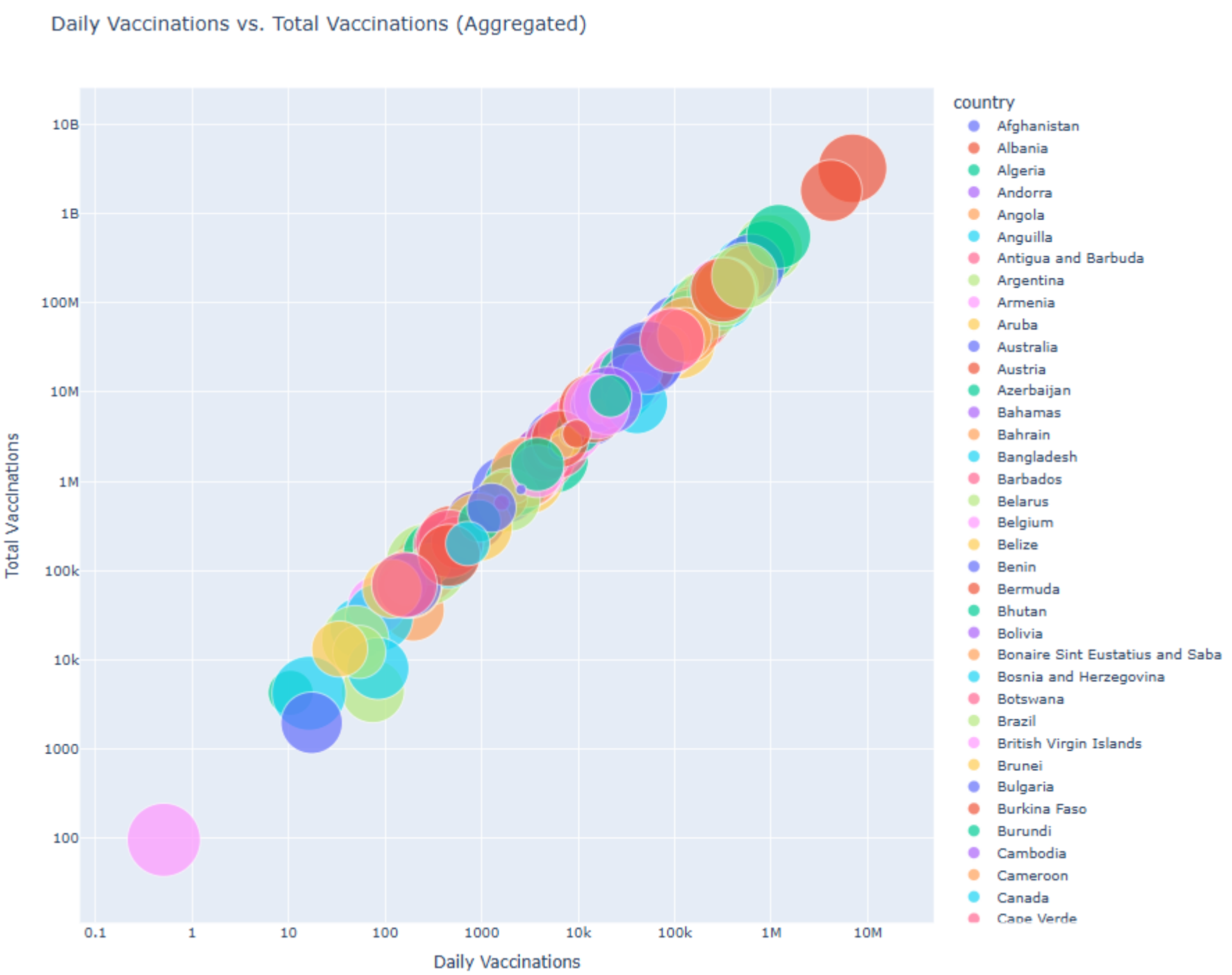
Vaccine Contribution by Country



Treemap Showing Vaccine Contribution by Country



Bubble Chart of Fully Vaccinated Percent vs. Daily Vaccinations per Million



Bubble Chart of Daily Vaccinations vs. Total Vaccinations

THANK YOU

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